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Working away from work and its implications for post-pandemic travel in Southern California

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California Resilient and Innovative Mobility Initiative

The UCLA Institute of Transportation Studies Research Team

- **Julene Paul**, Urban Planning PhD student

- **Fariba Siddiq**, Urban Planning PhD student

- **Samuel Speroni**, Urban Planning PhD student

- Plus, commencing collaboration with **Giovanni Circella** and his students and research staff at the UC Davis Institute of Transportation Studies

Report on research in progress

Source: Reno Gazette-Journal

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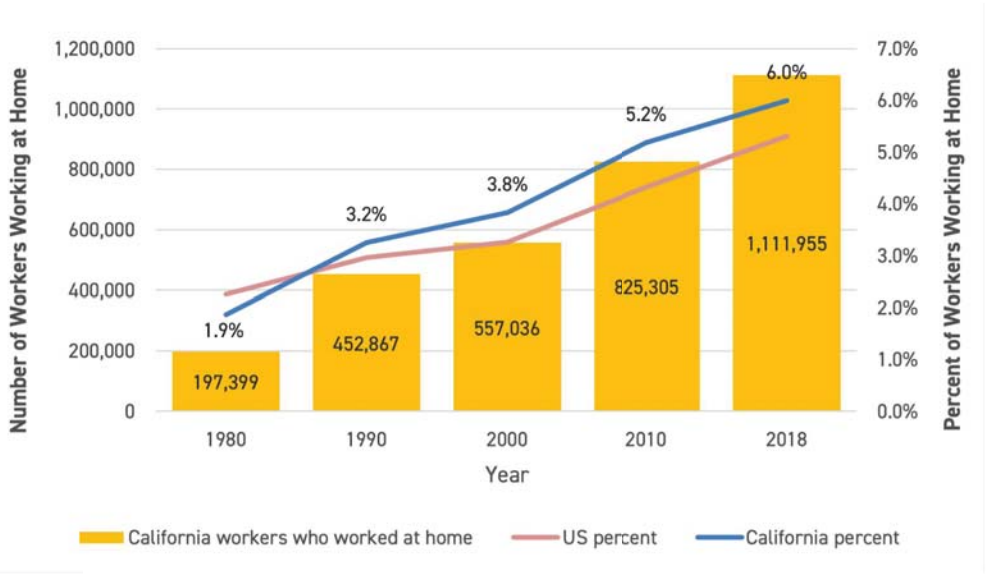
Research on Working from Home and Travel

Working from home (WFH) increased in the years leading up to the pandemic, but s-l-o-w-l-y



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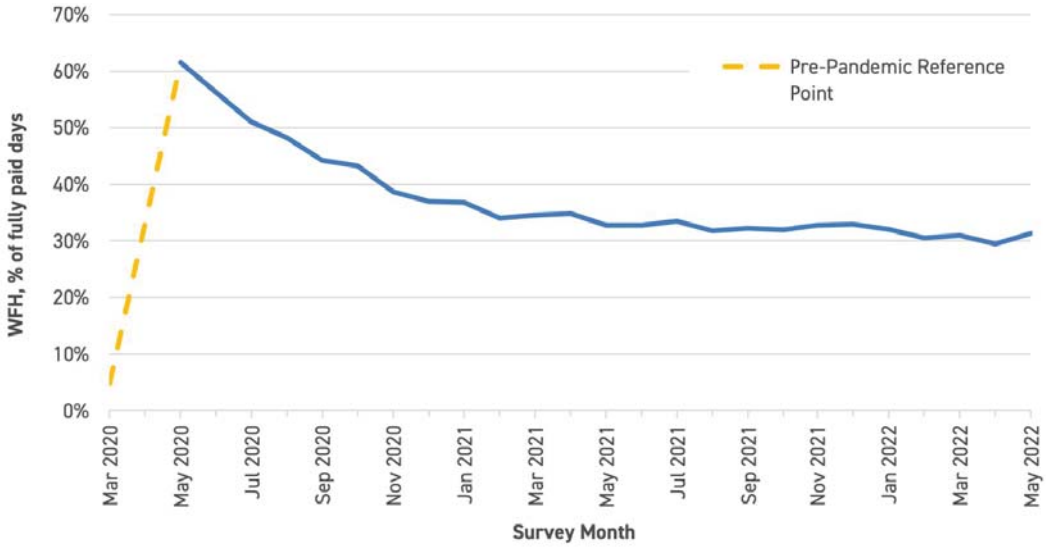
Source: US Census (1980-2000) and American Community Survey (2010, 2018)

WFH in the U.S. increased by 10X almost overnight, and has stayed at about 5X pre-pandemic levels for the past 18 months



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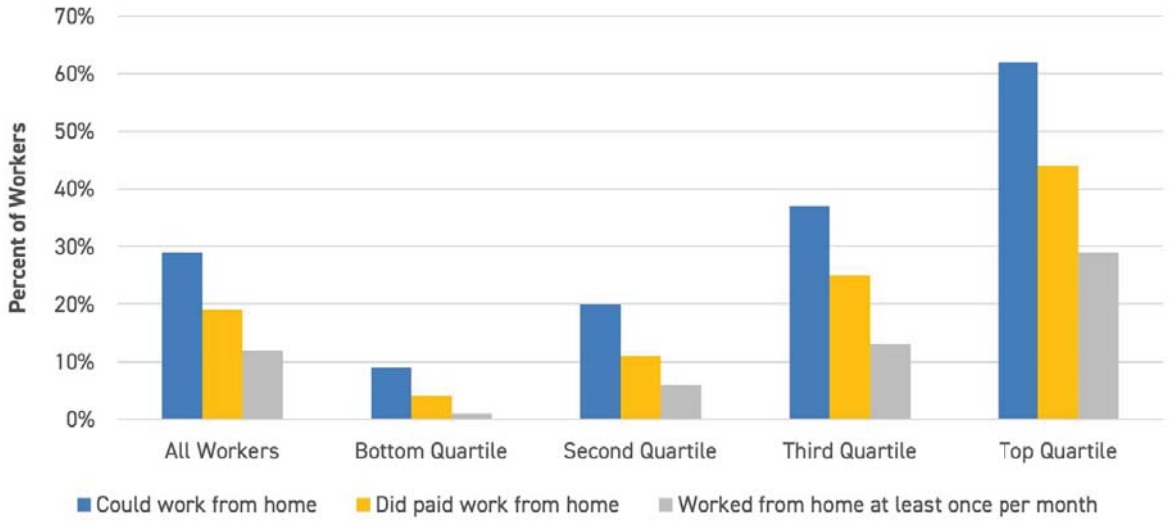
Source: Barrero et al. (2021) with updated data for 2022

Some definitions…

- Hybrid work, remote work, telecommuting, telework, work-from-home…
- These terms can be thrown around loosely
- Can range from…
  - Working from home full-time, perhaps even from another city…
    - Self-employed, or work for employer
  - …to answering an email on your phone at home after dinner.
- Involves the use of information and communications technologies, but not always
  - A garment worker may sew clothes at home
- No standard definition, but a common one is that remote workers spend more than half (>50%) of their time working from home
- Hybrid work:
  - Can split days between the office and home office
  - Can split hours in a given day between work and home

The opportunity to and frequency of working from home in the U.S. rises with income



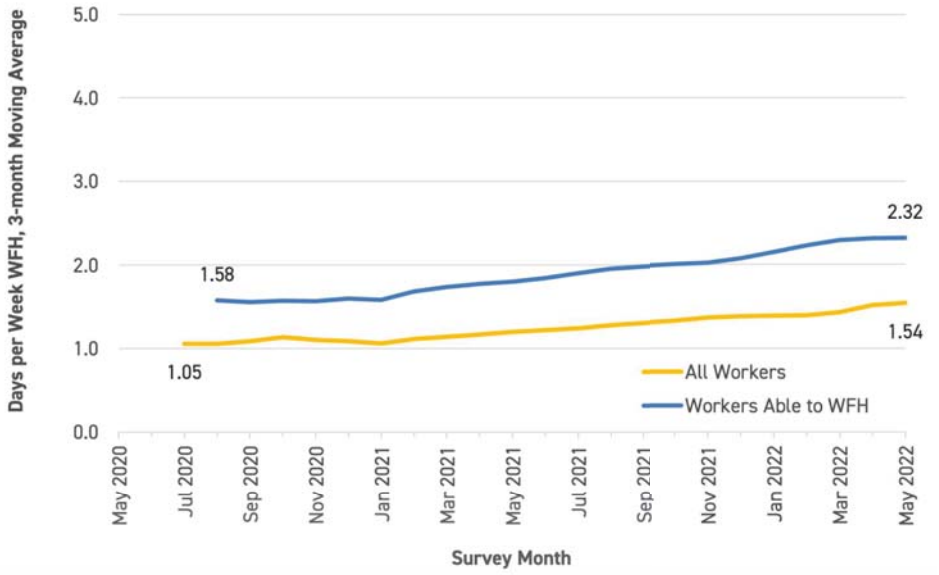
Source: Bureau of Labor Statistics (2019), adapted from Brookings Institution (Guyot and Sawhill, 2020)

Can and do…

- About 40 percent of jobs pre-pandemic (and perhaps as much as 50% today) in developed countries can be done remotely
    - Of these, about 2 out of 3 of those jobs were done remotely in 2021, at least part-time

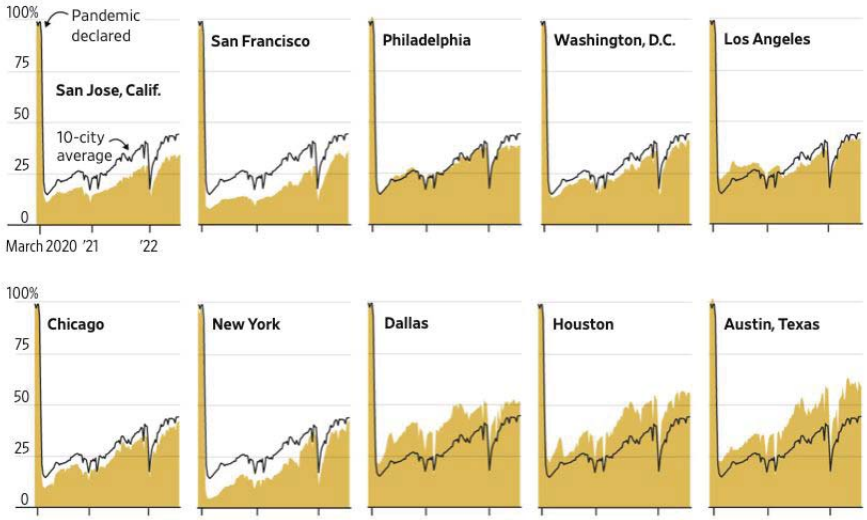
Source: TechCrunch.com

Employer-*planned* post-pandemic WFH is rising, not falling



Source: Barrero et al. (2021) with updated data for 2022

Percent of Pre-Pandemic Office Visitations by Workers
(LA is about average)



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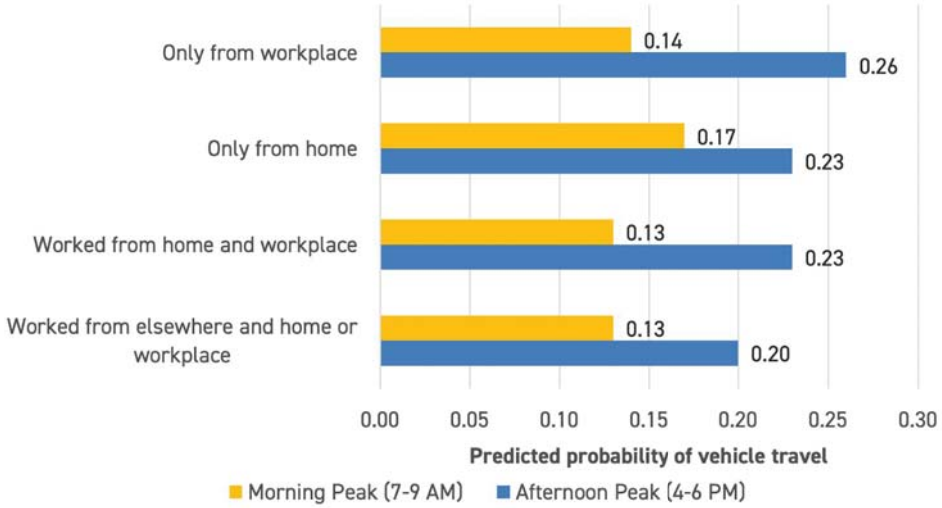
Kastle Systems keycard swipe data
Source: *Wall Street Journal* (Weber et al., 2022)

Even remote workers travel during peak periods



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Canadian General Social Survey 2005, Controlling for other factors
Source: Lachapelle et al. (2018)

Telecommuters (pre-pandemic) tended to live further from the office, and travel more for other trips

Type	Measure	Telecommuters*	Non-Telecommuters
Commute (One-Way)	Avg. Distance	21.3 mi.	13.7 mi.
	Avg. Duration	31.5 min.	23.4 min.
Total Work Trips (in trip day)	Avg. Distance	42.7 mi.	29.8 mi.
	Avg. Duration	71.9 min.	54.3 min.
	Avg. No. of Trips	2.4 trips	2.3 trips
Total Non-Work Trips (in trip day)	Avg. Distance	36.1 mi.	31.2 mi.
	Avg. Duration	73.6 min.	64.4 min.
	Avg. No. of Trips	4.2 trips	3.8 trips

**Telecommuters are defined here as any respondent who reported telecommuting ≥1 time per week*

Source: National Household Travel Survey (2009) via Zhu (2012)

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Most studies find no change or *increases* in travel associated with telecommuting (page 1)

Study	Location	Years	Data Source	Analysis Variable(s)	Findings
de Vos et al. (2018)	Netherlands	2002 – 2014 (biannual)	Labour Supply Panel	Commute duration	+ 5% longer commuting duration
					+8 hours of telecommuting = 3.5% longer commute dur.
Jin and Wu (2011)	United States	1995, 2001, 2009	National Household Travel Survey	*Several, including miles driven per year by telecommuting frequency:*	Approximations, 2009
				Almost every day	12,000*
				Once a week	17,000
				Once a month	17,000
				< once a month	15,500
				Never	15,000

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Most studies find no change or *increases* in travel associated with telecommuting (page 2)

Study	Location	Years	Data Source	Analysis Variable(s)	Findings
Zhu (2012)	United States	2001, 2009	National Household Travel Survey		Higher among telecommuters by:
				Work trips:	+5%
				Number of trips	+43%
				Trip distances	+33%
				Trip durations	
				Non-work trips:	+11%
				Number of trips	+16%
				Trip distances	+14%
				Trip durations	
Zhu and Mason (2014)	United States	2001, 2009	National Household Travel Survey		Higher among telecommuters by:
					+40%
				Work trip VMT	+16%
				Non-work trip VMT	+21%
				Total VMT	

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Most studies find no change or *increases* in travel associated with telecommuting (page 3)

Study	Location	Years	Data Source	Analysis Variable(s)	Findings
Zhu et al. (2018)	United States	2001, 2009	National Household Travel Survey	*Mean one-way commute distance by metro area population:* <1 mil. 1–3 mil. ≥3 mil. *Mean one-way commute duration by metro area population:* <1 mil. 1–3 mil. ≥3 mil.	Higher for telecommuters by: +52% +44% +31% +32% +26% +26%
Lachapelle et al. (2018)	Canada	2005	Canadian General Social Survey	Overall travel time Odds of using non-motorized travel mode	–14 min. +77%

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Most studies find no change or *increases* in travel associated with telecommuting (page 4)

Study	Location	Years	Data Source	Analysis Variable(s)	Findings
de Abreu e Silva and Melo (2018a)	United Kingdom	2005–2012	National Travel Survey	Path analysis models: Weekly trips and distances by mode Weekly trips and distances by purp.	Teleworking frequency is a function of commute distance
de Abreu e Silva and Melo (2018b)	United Kingdom	2005–2012	National Travel Survey	Weekly travel distance by car, by number of workers in household 1 2	% greater by 1-2 day per week TCers vs. never +47% +36%

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Most studies find no change or *increases* in travel associated with telecommuting (page 5)

Study	Location	Years	Data Source	Analysis Variable(s)	Findings
Caldarola and Sorrell (2022)	United Kingdom	2005–2019	National Travel Survey for England	*Percent difference from non-teleworkers, for medium-frequency telework trips per week:* Indiv. commute trips, distance Household commute trips, dist. Indiv. business trips, distance Indiv. non-work trips, distance Household non-work trips, dist. *for high-frequency telework†:* Indiv. commute trips, distance Household commute trips, dist. Indiv. business trips, distance Indiv. non-work trips, distance Household non-work trips, dist.	*Trips, Distance* –14.9%, +10.9% –5.4%, +19.0% +46.1%, +68.5% +7.8%, +12.9% +7.4%, +13.6% *Trips, Distance* –25.3%, –20.1% –15.6%, Not Sig. +24.5%, +47.0% +7.4%, Not Sig. Not Sig., Not Sig.
Kim (2017)	South Korea	2006	Seoul Metropolitan Area Household Travel Survey	*Household PMT and VMT effect among households on days:* without a commute with a commute telecommuting	 +1.3 PMT, +0.6 VMT +2.5 PMT, +1.3 VMT

Study finding travel *decreases* associated with telecommuting

Study	Location	Years	Data Source	Analysis Variable(s)	Findings
Choo et al. (2005)	United States	1988–1998	Aggregate time series data	Change in Total Annual VMT	–0.8% (upper bound, 90% confidence)

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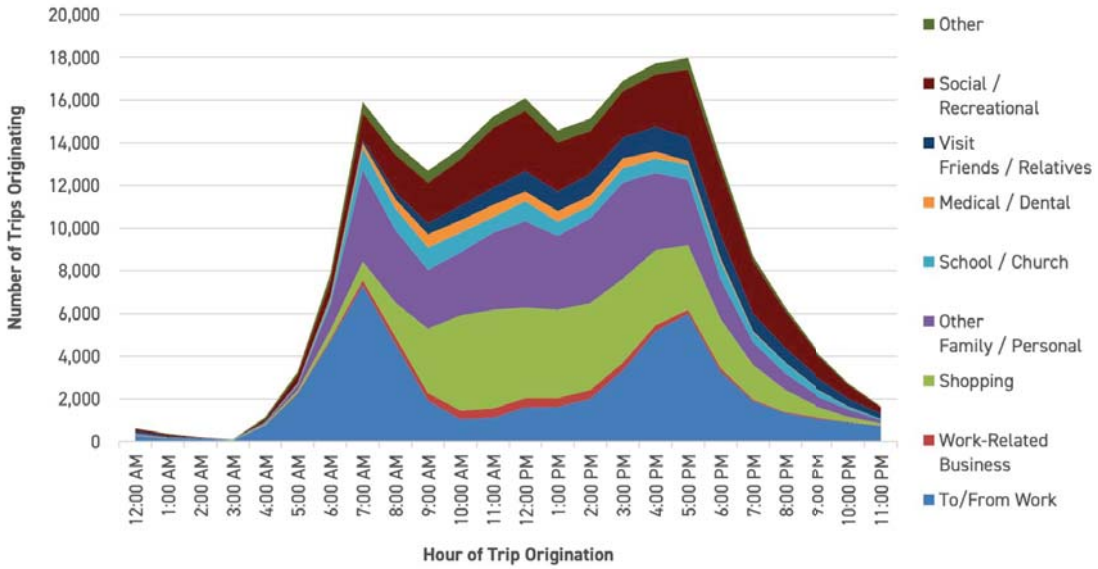
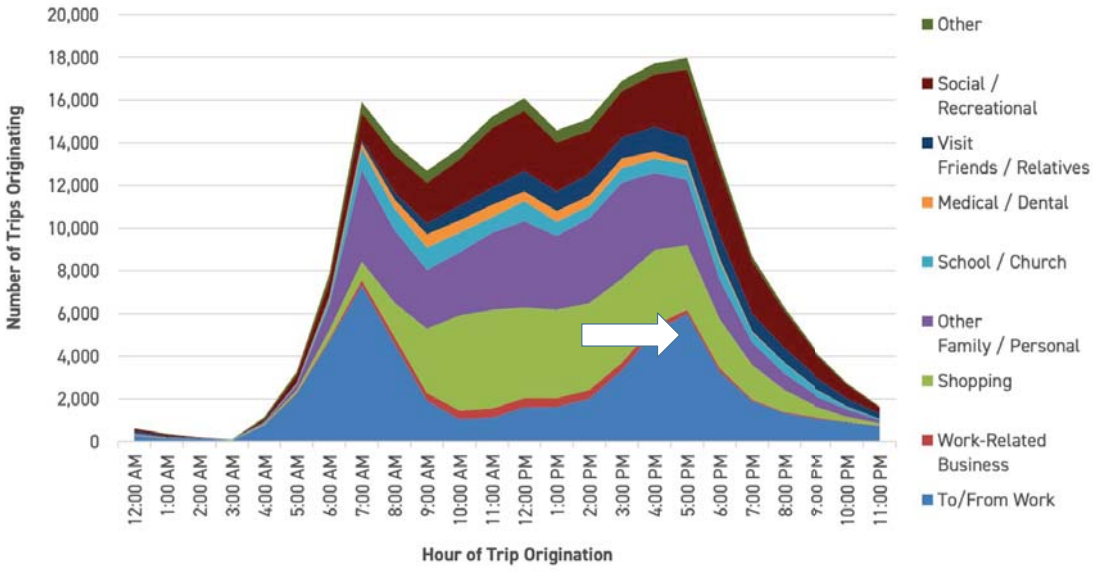
Commuting comprises a remarkably small share of personal trips, while household-serving trips comprise a surprisingly large share



Source: 2017 National Household Travel Survey

Pre-pandemic trip purposes by time of day in the U.S.:
Commuting is not all it's cracked-down to be



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Source: 2017 National Household Travel Survey

Transit systems serving downtowns and other major job centers have lost the most riders, and struggled the most to recover them

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Research Findings in a Nutshell

What the research tells us about WFH and travel

1. Remote work increased dramatically in the pandemic and appears likely to remain elevated for many years to come
   - Though the exact levels remain uncertain

2. Not everyone can work remotely – but for those who can, the option to do so (at least part-time) is extremely popular

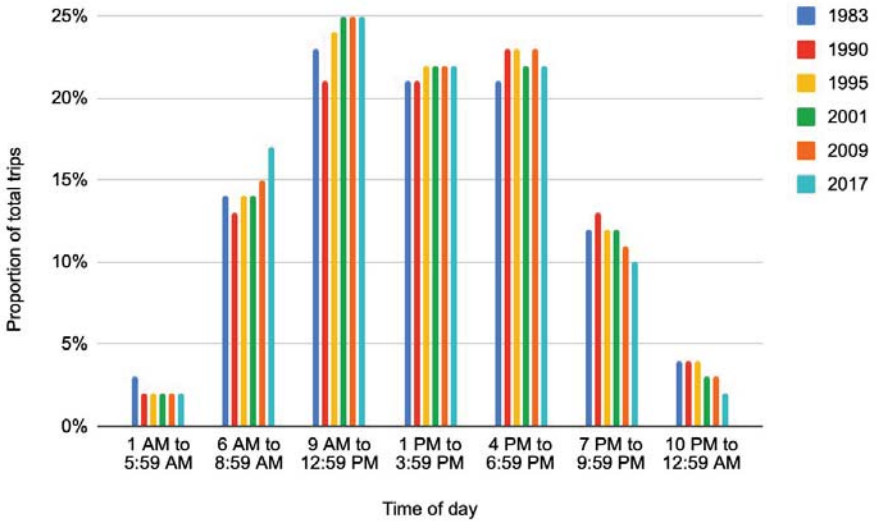
3. Employers tend to be more skeptical of remote work, but expect that it will persist.
   - But research does not support employer fears of declining productivity.

What the research tells us about WFH and travel

4. Telecommuting has long been touted as a potential solution to chronic transportation problems like traffic congestion and vehicle emissions.
   - However, research has generally found that home workers tend to ***drive more***, not less.
   - This is because:
     - Home workers tend to run more errands during the day, and errands comprise a surprisingly large share of personal travel.
     - People who work from home full- or part-time tend to live farther from worksites than those who commute every day.
5. The implications of the rise of WFH is especially consequential for public transit systems.
   - Especially those that rely on commuters into and out of downtowns and other major job centers like universities and airports.

Peak Period Travel Trends in the SCAG Region

Between 1983 and 2017 in the U.S., trips shifted away from the evening and toward morning and mid-day



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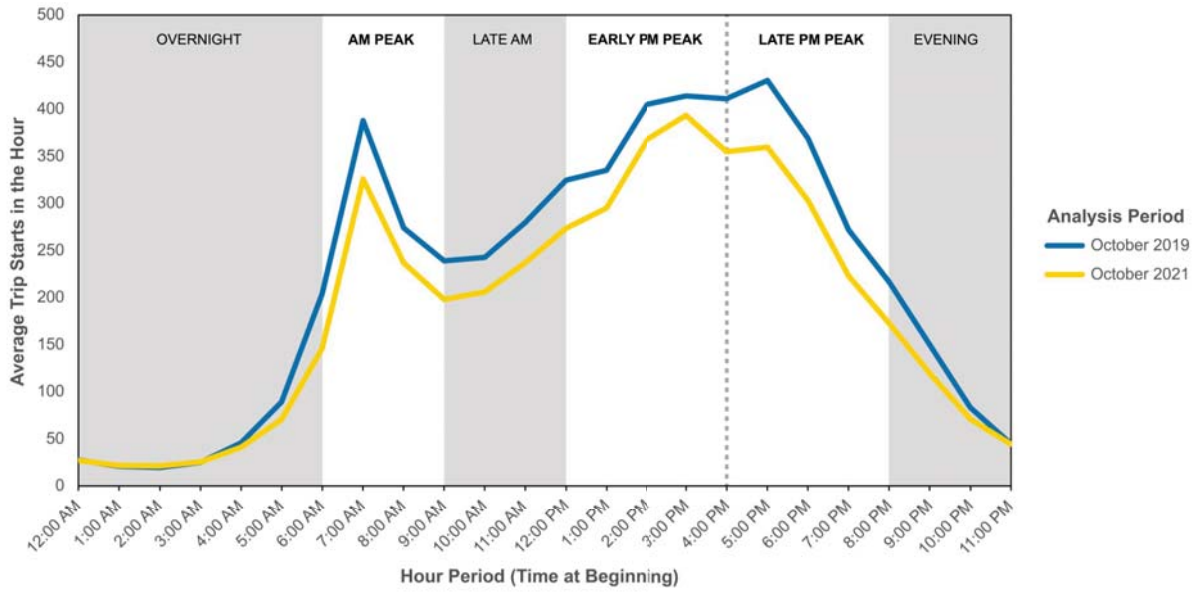
Source: 2017 National Household Travel Survey

Trip-making (mid-week) is down somewhat between Oct '19 and Oct '21, but the peak of the PM peak has shifted earlier



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Source: StreetLight Data

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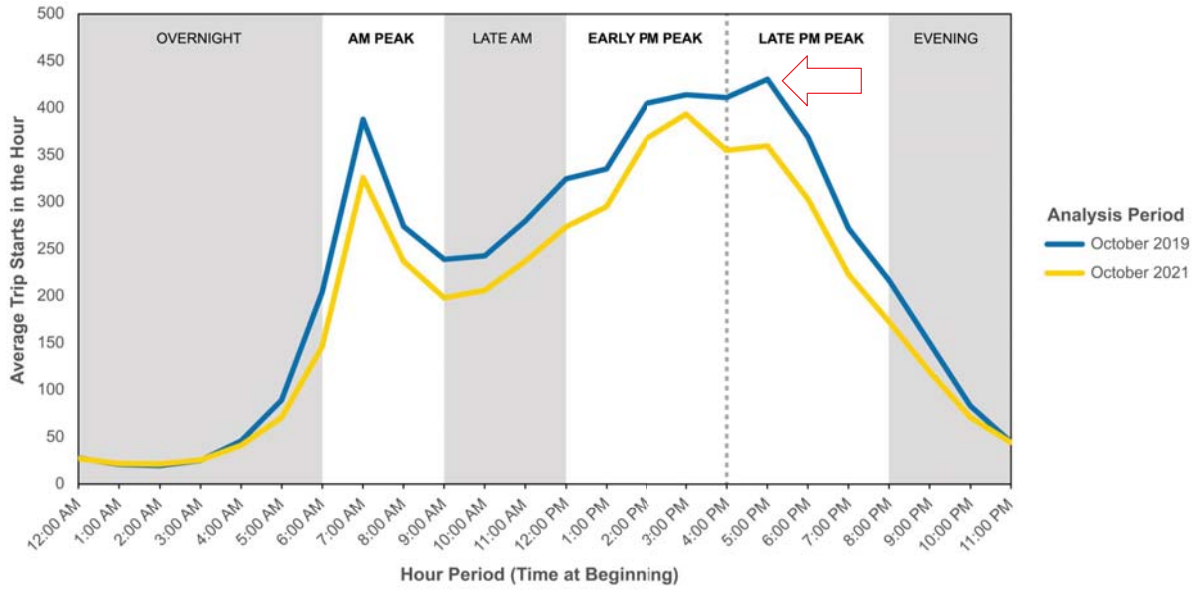

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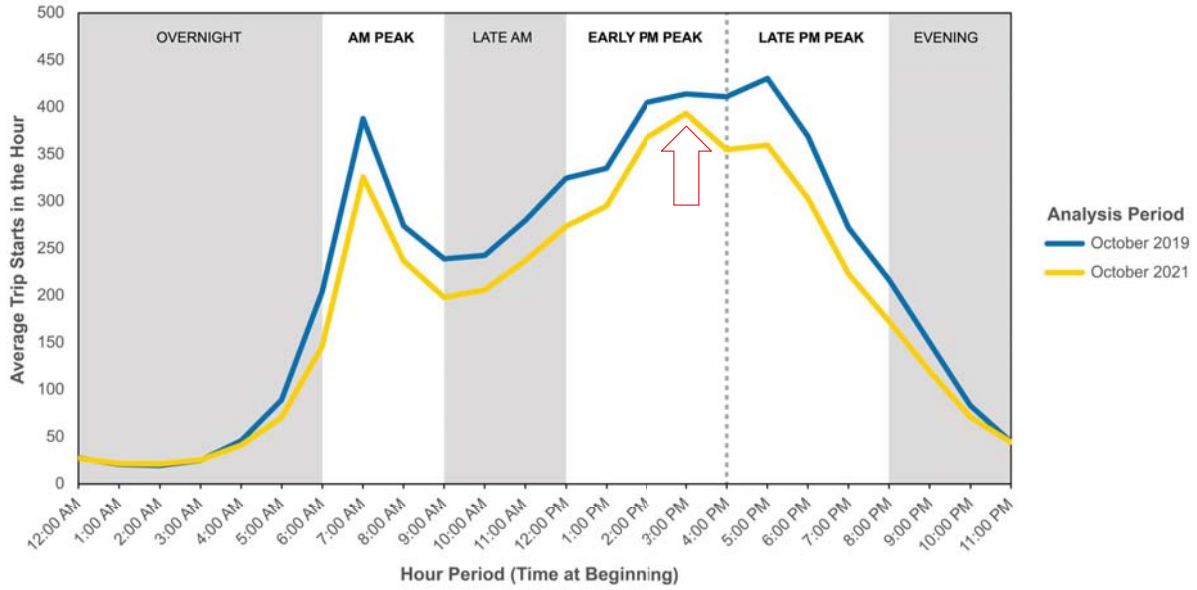

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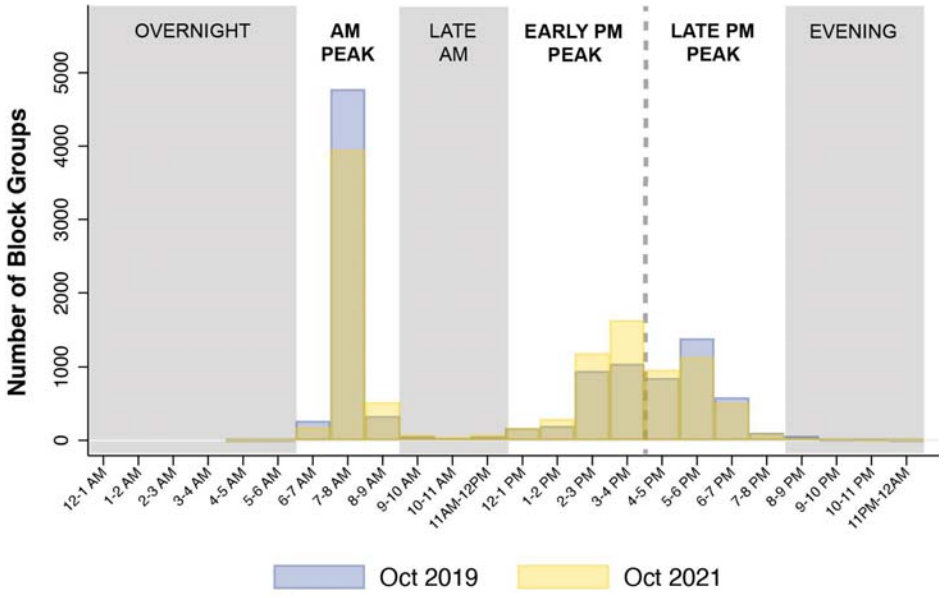
Source: StreetLight Data

Top Trip Origination Hour for Block Groups in SCAG Region, Midweek, October 2019 & 2021



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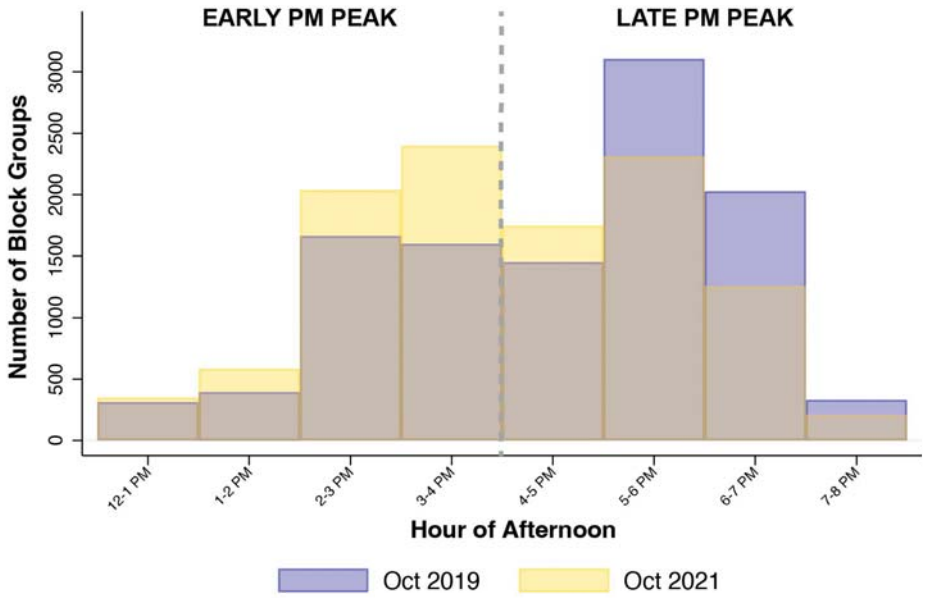

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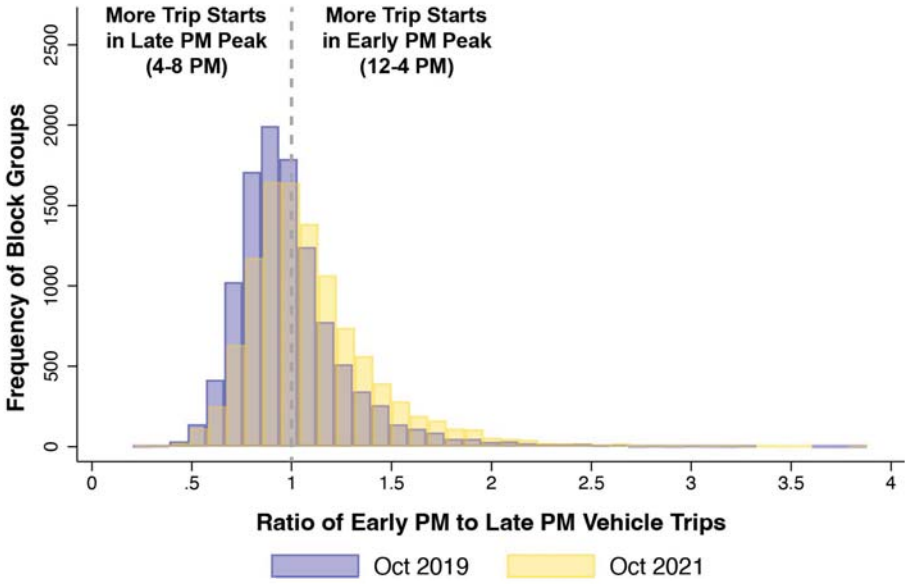
Source: StreetLight Data

The midweek ratio of early-to-late vehicle trips shifted across SCAG block groups from October 2019 & 2021



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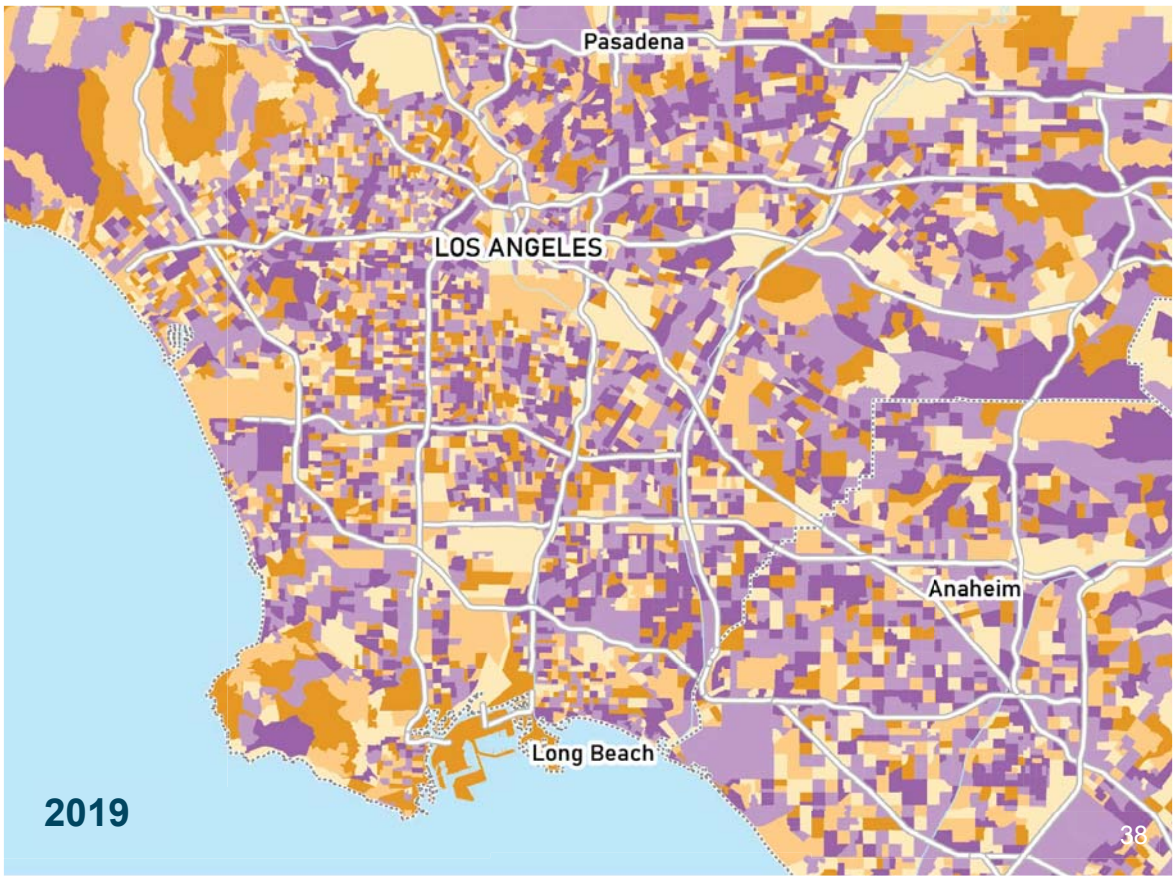
Source: StreetLight Data

Map of Early-to-Late Vehicle Trips Ratio

Greater Los Angeles, Midweek, October 2019 & 2021

Source: StreetLight Data



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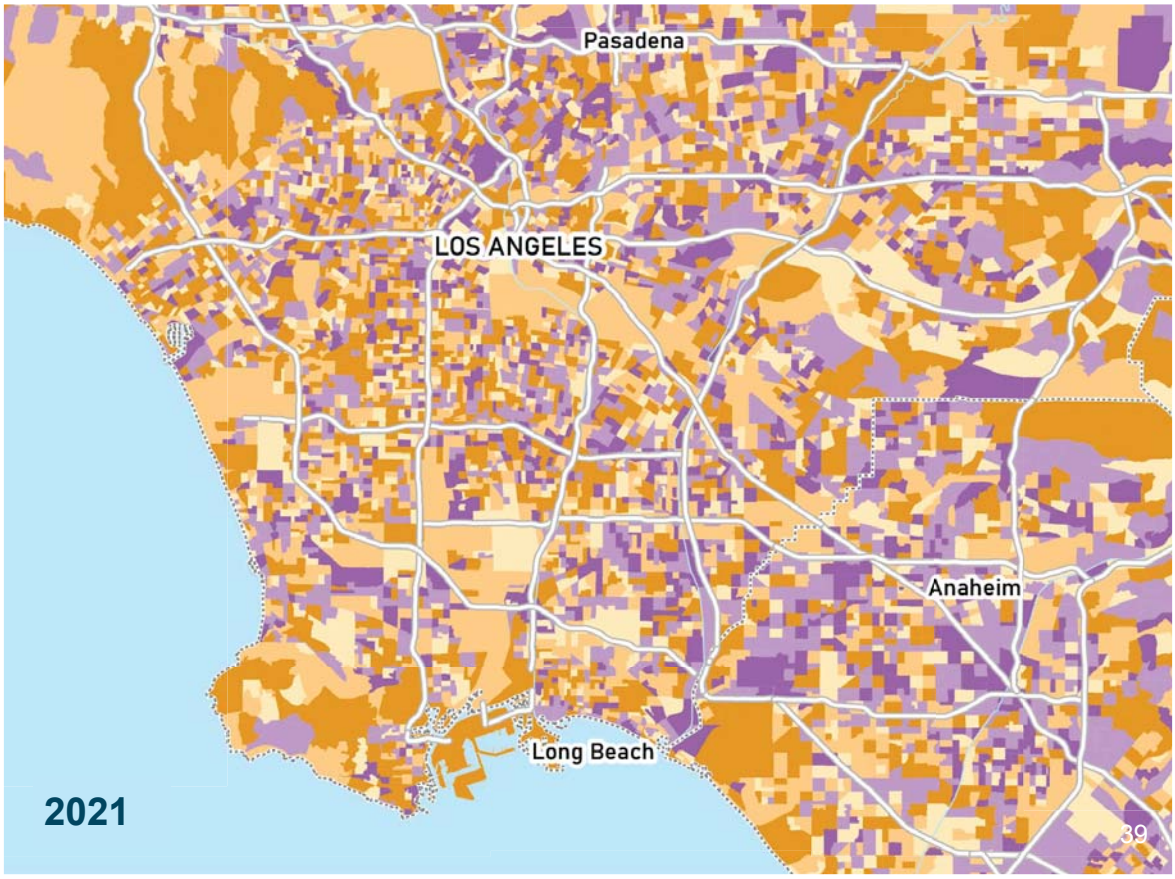

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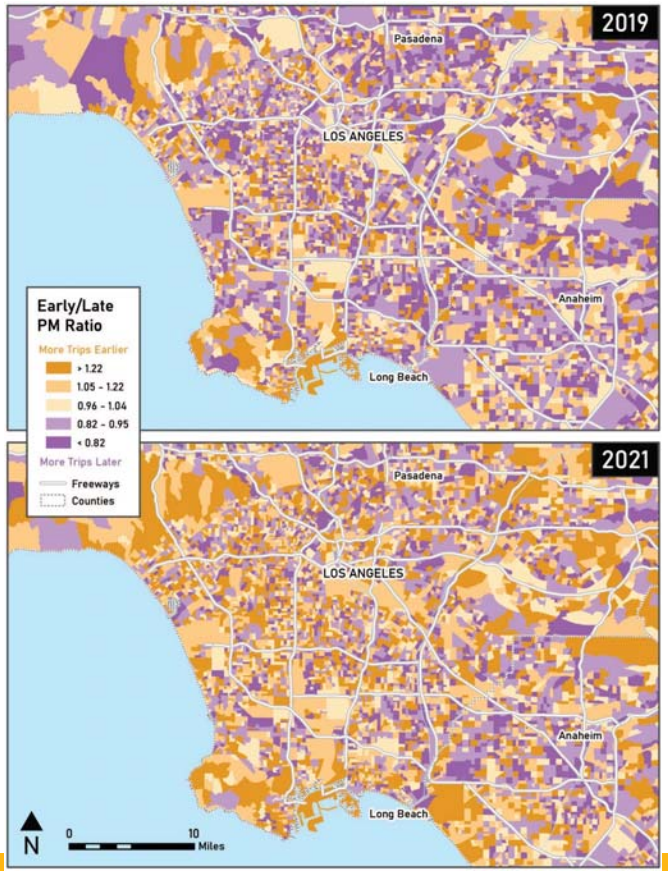

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Why the relative increase in early afternoon trips?

- Prior to and during the pandemic, the number of K-12 students attending school in the block group was, by far, the strongest predictor of early afternoon trip-making.

- By the fall of 2021, the ability of block group workers to work from home joined the number of block group students as the second strongest predictor of early afternoon trip-making.
  - The ability to work from home was especially important in explaining the *pandemic shift* to early afternoon trip-making

Implications for the future of the SCAG region

- The PM peak period is today a misnomer in the SCAG region
- The PM "peak" now runs a full eight hours, from noon to 8 PM on midweek days
- "PM mountain range period" might today be a more apt descriptor

- In addition to lasting a third of each midweek day, the peak of the PM period has shifted from the late (pre-pandemic) to the early (late pandemic) afternoon

- Early afternoon trip-making is associated with K-12 students in a block group
  - Which implies significant parent chauffeuring of younger travelers and (perhaps) more driving to and from school among high-school students
    - More than 80 percent of California students depart school between 2 and 4 PM
    - More than ⅔ of California schoolchildren are driven or drive to school
    - Less than ⅓ of students live within a mile of school
    - California makes relatively little use of school buses

Implications for the future of the SCAG region

- The shift to working from home, at least part-time, appears to be enduring
- The effects of this shift on overall vehicle are likely modest,
- While the effects on public transit systems – especially those serving downtowns and other major job centers – are to date substantial and may or may not be enduring
- Transit's role in providing mobility for those without has been heightened by the pandemic, as downtown commuters have left transit
- There may be hope for a downtown transit revival depending on how office markets shake out, but we won't know how this will play out for a while

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Questions? Comments?

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